SEQUENCE LISTING

<110> Acton, Susan

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<170> PatentIn Ver. 2.0

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    Gln Lys Arg Leu Ile Pro Glu Arg Thr Val Trp Lys Tyr Phe Val Gln
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    Leu Cys Ser Ala Leu Glu His Met His Ser Arg Arg Val Met His Arg
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    Asp Ile Lys Pro Ala Asn Val Phe Ile Thr Ala Thr Gly Val Val Lys
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    Leu Gly Asp Leu Gly Leu Gly Arg Phe Phe Ser Ser Lys Thr Thr Ala
                180                 185                 190

    Ala His Ser Leu Val Gly Thr Pro Tyr Tyr Met Ser Pro Glu Arg Ile
            195                 200                 205

    His Glu Asn Gly Tyr Asn Phe Lys Ser Asp Ile Trp Ser Leu Gly Cys
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    Leu Leu Tyr Glu Met Ala Ala Leu Gln Ser Pro Phe Tyr Gly Asp Lys
    225                 230                 235                 240

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    Pro Leu Pro Ser Asp His Tyr Ser Glu Glu Leu Arg Gln Leu Val Asn
                260                 265                 270

    Met Cys Ile Asn Pro Asp Pro Glu Lys Arg Pro Asp Val Thr Tyr Val
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       caa cca cag aag gcc tta cga ccg gat atg ggc tat aat aca tta gcc    96
       Gln Pro Gln Lys Ala Leu Arg Pro Asp Met Gly Tyr Asn Thr Leu Ala
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       Asn Phe Arg Ile Glu Lys Lys Ile Gly Arg Gly Gln Phe Ser Glu Val
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       tat aga gca gcc tgt ctc ttg gat gga gta cca gta gct tta aaa aaa   192
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       gtg cag ata ttt gat tta atg gat gcc aaa gca cgt gct gat tgc atc   240
       Val Gln Ile Phe Asp Leu Met Asp Ala Lys Ala Arg Ala Asp Cys Ile
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       aaa gaa ata gat ctt ctt aag caa ctc aac cat cca aat gta ata aaa   288
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                       85                  90                  95
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       tat tat gca tca ttc att gaa gat aat gaa cta aac ata gtt ttg gaa   336
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       Leu Ala Asp Ala Gly Asp Leu Ser Arg Met Ile Lys His Phe Lys Lys
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       caa aag agg cta att cct gaa aga act gtt tgg aag tat ttt gtt cag   432
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5                        165                    170                    175

     ctt gga gat ctt ggg ctt ggc cgg ttt ttc agc tca aaa acc aca gct        576
     Leu Gly Asp Leu Gly Leu Gly Arg Phe Phe Ser Ser Lys Thr Thr Ala
                         180                    185                    190
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     gca cat tct tta gtt ggt acg cct tat tac atg tct cca gag aga ata        624
     Ala His Ser Leu Val Gly Thr Pro Tyr Tyr Met Ser Pro Glu Arg Ile
                         195                    200                    205

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     His Glu Asn Gly Tyr Asn Phe Lys Ser Asp Ile Trp Ser Leu Gly Cys
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20   Leu Leu Tyr Glu Met Ala Ala Leu Gln Ser Pro Phe Tyr Gly Asp Lys
     225                    230                    235                    240

     atg aat tta tac tca ctg tgt aag aag ata gaa cag tgt gac tac cca        768
     Met Asn Leu Tyr Ser Leu Cys Lys Lys Ile Glu Gln Cys Asp Tyr Pro
25                       245                    250                    255

     cct ctt cct tca gat cac tat tca gaa gaa ctc cga cag tta gtt aat        816
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     Met Cys Ile Asn Pro Asp Pro Glu Lys Arg Pro Asp Val Thr Tyr Val
                         275                    280                    285

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   5    Glu Asn Cys Gly Gly Gly Ser Phe Gly Ser Val Tyr Arg Ala Lys Trp
        20              25              30              35

        ata tca cag gac aag gag gtg gct gta aag aag ctc ctc aaa ata gag    199
  10    Ile Ser Gln Asp Lys Glu Val Ala Val Lys Lys Leu Leu Lys Ile Glu
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        aaa gag gca gaa ata ctc agt gtc ctc agt cac aga aac atc atc cag    247
        Lys Glu Ala Glu Ile Leu Ser Val Leu Ser His Arg Asn Ile Ile Gln
                        55              60              65
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        ttt tat gga gta att ctt gaa cct ccc aac tat ggc att gtc aca gaa    295
        Phe Tyr Gly Val Ile Leu Glu Pro Pro Asn Tyr Gly Ile Val Thr Glu
                    70              75              80

  20    tat gct tct ctg gga tca ctc tat gat tac att aac agt aac aga agt    343
        Tyr Ala Ser Leu Gly Ser Leu Tyr Asp Tyr Ile Asn Ser Asn Arg Ser
              85              90              95

        gag gag atg gat atg gat cac att atg acc tgg gcc act gat gta gcc    391
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        aaa gga atg cat tat tta cat atg gag gct cct gtc aag gtg att cac    439
        Lys Gly Met His Tyr Leu His Met Glu Ala Pro Val Lys Val Ile His
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        aga gac ctc aag tca aga aac gtt gtt ata gct gct gat gga gta ctg    487
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                        135             140             145
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        Lys Ile Cys Asp Phe Gly Ala Ser Arg Phe His Asn His Thr Thr His
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        agt ctc cct gtg tca gaa act tgt gac aca tat tcc tat ggt gtg gtt    631
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        tta caa gta gct tgg ctt gta gtg gaa aaa aac gag aga tta acc att    727
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      gaa gct gat gcc aag aaa cgg cca tca ttc aag caa atc att tca atc   823
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      Leu Glu Ser Met Ser Asn Asp Thr Ser Leu Pro Asp Lys Cys Asn Ser
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      Glu Glu Ser Tyr Phe Glu Ser Lys Thr Glu Glu Ser Asn Ser Ala Glu
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      atg tca tgt cag atc aca gca aca agt aac ggg gag ggc cat ggc atg   1159
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      Asn Pro Ser Leu Gln Ala Met Met Leu Met Gly Phe Gly Asp Ile Phe
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      Ser Met Asn Lys Ala Gly Ala Val Met His Ser Gly Met Gln Ile Asn
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      Met Gln Ala Lys Gln Asn Ser Ser Lys Thr Thr Ser Lys Arg Arg Gly
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        Val Thr Glu Tyr Ala Ser Leu Gly Ser Leu Tyr Asp Tyr Ile Asn Ser
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        Asn Arg Ser Glu Glu Met Asp Met Asp His Ile Met Thr Trp Ala Thr
                    100                 105                 110
   5
        Asp Val Ala Lys Gly Met His Tyr Leu His Met Glu Ala Pro Val Lys
                    115                 120                 125

        Val Ile His Arg Asp Leu Lys Ser Arg Asn Val Val Ile Ala Ala Asp
  10        130                 135                 140

        Gly Val Leu Lys Ile Cys Asp Phe Gly Ala Ser Arg Phe His Asn His
        145                 150                 155                 160

  15    Thr Thr His Met Ser Leu Val Gly Thr Phe Pro Trp Met Ala Pro Glu
                        165                 170                 175

        Val Ile Gln Ser Leu Pro Val Ser Glu Thr Cys Asp Thr Tyr Ser Tyr
                    180                 185                 190
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        Gly Val Val Leu Trp Glu Met Leu Thr Arg Glu Val Pro Phe Lys Gly
                    195                 200                 205

        Leu Glu Gly Leu Gln Val Ala Trp Leu Val Val Glu Lys Asn Glu Arg
  25        210                 215                 220

        Leu Thr Ile Pro Ser Ser Cys Pro Arg Ser Phe Ala Glu Leu Leu His
        225                 230                 235                 240

  30    Gln Cys Trp Glu Ala Asp Ala Lys Lys Arg Pro Ser Phe Lys Gln Ile
                        245                 250                 255

        Ile Ser Ile Leu Glu Ser Met Ser Asn Asp Thr Ser Leu Pro Asp Lys
                    260                 265                 270
  35
        Cys Asn Ser Phe Leu His Asn Lys Ala Glu Trp Arg Cys Glu Ile Glu
                    275                 280                 285

        Ala Thr Leu Glu Arg Leu Lys Lys Leu Glu Arg Asp Leu Ser Phe Lys
  40        290                 295                 300

        Glu Gln Glu Leu Lys Glu Arg Glu Arg Arg Leu Lys Met Trp Glu Gln
        305                 310                 315                 320

  45    Lys Leu Thr Glu Gln Ser Asn Thr Pro Leu Leu Leu Pro Leu Ala Ala
                    325                 330                 335

        Arg Met Ser Glu Glu Ser Tyr Phe Glu Ser Lys Thr Glu Glu Ser Asn
                    340                 345                 350
  50
        Ser Ala Glu Met Ser Cys Gln Ile Thr Ala Thr Ser Asn Gly Glu Gly
                    355                 360                 365

        His Gly Met Asn Pro Ser Leu Gln Ala Met Met Leu Met Gly Phe Gly
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```
           370                    375                    380
      Asp Ile Phe Ser Met Asn Lys Ala Gly Ala Val Met His Ser Gly Met
      385                 390                 395                 400
 5
      Gln Ile Asn Met Gln Ala Lys Gln Asn Ser Ser Lys Thr Thr Ser Lys
                      405                 410                 415

      Arg Arg Gly Lys Lys Val Asn Met Ala Leu Gly Phe Ser Asp Phe Asp
10                    420                 425                 430
      Leu Ser Glu Gly Asp Asp Asp Asp Asp Asp Gly Glu Glu Glu Asp
                  435                 440                 445

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            450                 455


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        1               5                  10                  15

      cag ttt ttt gaa aac tgc ggt gga gga agt ttt ggg agt gtt tat cga    96
      Gln Phe Phe Glu Asn Cys Gly Gly Gly Ser Phe Gly Ser Val Tyr Arg
35                    20                  25                  30

      gcc aaa tgg ata tca cag gac aag gag gtg gct gta aag aag ctc ctc   144
      Ala Lys Trp Ile Ser Gln Asp Lys Glu Val Ala Val Lys Lys Leu Leu
                  35                  40                  45
40
      aaa ata gag aaa gag gca gaa ata ctc agt gtc ctc agt cac aga aac   192
      Lys Ile Glu Lys Glu Ala Glu Ile Leu Ser Val Leu Ser His Arg Asn
            50                  55                  60

45    atc atc cag ttt tat gga gta att ctt gaa cct ccc aac tat ggc att   240
      Ile Ile Gln Phe Tyr Gly Val Ile Leu Glu Pro Pro Asn Tyr Gly Ile
      65                  70                  75                  80

      gtc aca gaa tat gct tct ctg gga tca ctc tat gat tac att aac agt   288
50    Val Thr Glu Tyr Ala Ser Leu Gly Ser Leu Tyr Asp Tyr Ile Asn Ser
                      85                  90                  95

      aac aga agt gag gag atg gat atg gat cac att atg acc tgg gcc act   336
      Asn Arg Ser Glu Glu Met Asp Met Asp His Ile Met Thr Trp Ala Thr
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                    100                     105                     110

      gat gta gcc aaa gga atg cat tat tta cat atg gag gct cct gtc aag   384
      Asp Val Ala Lys Gly Met His Tyr Leu His Met Glu Ala Pro Val Lys
  5       115                 120                 125

      gtg att cac aga gac ctc aag tca aga aac gtt gtt ata gct gct gat   432
      Val Ile His Arg Asp Leu Lys Ser Arg Asn Val Val Ile Ala Ala Asp
          130                 135                 140
 10
      gga gta ctg aag atc tgt gac ttt ggt gcc tct cgg ttc cat aac cat   480
      Gly Val Leu Lys Ile Cys Asp Phe Gly Ala Ser Arg Phe His Asn His
      145                 150                 155                 160

 15   aca aca cac atg tcc ttg gtt gga act ttc cca tgg atg gct cca gaa   528
      Thr Thr His Met Ser Leu Val Gly Thr Phe Pro Trp Met Ala Pro Glu
                      165                 170                 175

      gtt atc cag agt ctc cct gtg tca gaa act tgt gac aca tat tcc tat   576
 20   Val Ile Gln Ser Leu Pro Val Ser Glu Thr Cys Asp Thr Tyr Ser Tyr
                  180                 185                 190

      ggt gtg gtt ctc tgg gag atg cta aca agg gag gtc ccc ttt aaa ggt   624
      Gly Val Val Leu Trp Glu Met Leu Thr Arg Glu Val Pro Phe Lys Gly
 25           195                 200                 205

      ttg gaa gga tta caa gta gct tgg ctt gta gtg gaa aaa aac gag aga   672
      Leu Glu Gly Leu Gln Val Ala Trp Leu Val Val Glu Lys Asn Glu Arg
              210                 215                 220
 30
      tta acc att cca agc agt tgc ccc aga agt ttt gct gaa ctg tta cat   720
      Leu Thr Ile Pro Ser Ser Cys Pro Arg Ser Phe Ala Glu Leu Leu His
      225                 230                 235                 240

 35   cag tgt tgg gaa gct gat gcc aag aaa cgg cca tca ttc aag caa atc   768
      Gln Cys Trp Glu Ala Asp Ala Lys Lys Arg Pro Ser Phe Lys Gln Ile
                      245                 250                 255

      att tca atc ctg gag tcc atg tca aat gac acg agc ctt cct gac aag   816
 40   Ile Ser Ile Leu Glu Ser Met Ser Asn Asp Thr Ser Leu Pro Asp Lys
                  260                 265                 270

      tgt aac tca ttc cta cac aac aag gcg gag tgg agg tgc gaa att gag   864
      Cys Asn Ser Phe Leu His Asn Lys Ala Glu Trp Arg Cys Glu Ile Glu
 45           275                 280                 285

      gca act ctt gag agg cta aag aaa cta gag cgt gat ctc agc ttt aag   912
      Ala Thr Leu Glu Arg Leu Lys Lys Leu Glu Arg Asp Leu Ser Phe Lys
              290                 295                 300
 50
      gag cag gag ctt aaa gaa cga gaa aga cgt tta aag atg tgg gag caa   960
      Glu Gln Glu Leu Lys Glu Arg Glu Arg Arg Leu Lys Met Trp Glu Gln
      305                 310                 315                 320
```

```
    aag ctg aca gag cag tcc aac acc ccg ctt ctc ttg cct ctt gct gca    1008
    Lys Leu Thr Glu Gln Ser Asn Thr Pro Leu Leu Leu Pro Leu Ala Ala
                325             330             335

5   aga atg tct gag gag tct tac ttt gaa tct aaa aca gag gag tca aac    1056
    Arg Met Ser Glu Glu Ser Tyr Phe Glu Ser Lys Thr Glu Glu Ser Asn
                340             345             350

10  agt gca gag atg tca tgt cag atc aca gca aca agt aac ggg gag ggc    1104
    Ser Ala Glu Met Ser Cys Gln Ile Thr Ala Thr Ser Asn Gly Glu Gly
                355             360             365

    cat ggc atg aac cca agt ctg cag gcc atg atg ctg atg ggc ttt ggg    1152
    His Gly Met Asn Pro Ser Leu Gln Ala Met Met Leu Met Gly Phe Gly
15      370             375             380

    gat atc ttc tca atg aac aaa gca gga gct gtg atg cat tct ggg atg    1200
    Asp Ile Phe Ser Met Asn Lys Ala Gly Ala Val Met His Ser Gly Met
    385             390             395             400

20
    cag ata aac atg caa gcc aag cag aat tct tcc aaa acc aca tct aag    1248
    Gln Ile Asn Met Gln Ala Lys Gln Asn Ser Ser Lys Thr Thr Ser Lys
                405             410             415

25  aga agg ggg aag aaa gtc aac atg gct ctg ggg ttc agt gat ttt gac    1296
    Arg Arg Gly Lys Lys Val Asn Met Ala Leu Gly Phe Ser Asp Phe Asp
                420             425             430

    ttg tca gaa ggt gac gat gat gat gat gat gac ggt gag gag gag gat    1344
30  Leu Ser Glu Gly Asp Asp Asp Asp Asp Asp Asp Gly Glu Glu Glu Asp
                435             440             445

    aat gac atg gat aat agt gaa                                         1365
    Asn Asp Met Asp Asn Ser Glu
35      450             455


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    Val Arg Gln Ala Leu Gly Arg Gly Leu Gln Leu Gly Arg Ala Leu Leu
                5               10              15
```

```
      ctg cgc ttc acg ggc aag ccc ggc cgg gcc tac ggc ttg ggg cgg ccg    152
      Leu Arg Phe Thr Gly Lys Pro Gly Arg Ala Tyr Gly Leu Gly Arg Pro
       20              25                  30
  5

      ggc ccg gcg gcg ggc tgt gtc cgc ggg gag cgt cca ggc tgg gcc gca    200
      Gly Pro Ala Ala Gly Cys Val Arg Gly Glu Arg Pro Gly Trp Ala Ala
       35              40                  45                  50

 10   gga ccg ggc gcg gag cct cgc agg gtc ggg ctc ggg ctt cct aac cgt    248
      Gly Pro Gly Ala Glu Pro Arg Arg Val Gly Leu Gly Leu Pro Asn Arg
                       55                  60                  65

      ctc cgc ttc ttc cgc cag tcg gtg gcc ggg ctg gcg gcg cgg ttg cag    296
 15   Leu Arg Phe Phe Arg Gln Ser Val Ala Gly Leu Ala Ala Arg Leu Gln
                   70                  75                  80

      cgg cag ttc gtg gtg cgg gcc tgg ggc tgc gcg ggc cct tgc ggc cgg    344
      Arg Gln Phe Val Val Arg Ala Trp Gly Cys Ala Gly Pro Cys Gly Arg
 20           85                  90                  95

      gca gtc ttt ctg gcc ttc ggg cta ggg ctg ggc ctc atc gag gaa aaa    392
      Ala Val Phe Leu Ala Phe Gly Leu Gly Leu Gly Leu Ile Glu Glu Lys
               100                 105                 110
 25

      cag gcg gag agc cgg cgg gcg gtc tcg gcc tgt cag gag atc cag gca    440
      Gln Ala Glu Ser Arg Arg Ala Val Ser Ala Cys Gln Glu Ile Gln Ala
      115                 120                 125                 130

 30   att ttt acc cag aaa agc aag ccg ggg cct gac ccg ttg gac acg aga    488
      Ile Phe Thr Gln Lys Ser Lys Pro Gly Pro Asp Pro Leu Asp Thr Arg
                       135                 140                 145

      cgc ttg cag ggc ttt cgg ctg gag gag tat ctg ata ggg cag tcc att    536
 35   Arg Leu Gln Gly Phe Arg Leu Glu Glu Tyr Leu Ile Gly Gln Ser Ile
                   150                 155                 160

      ggt aag ggc tgc agt gct gct gtg tat gaa gcc acc atg cct aca ttg    584
      Gly Lys Gly Cys Ser Ala Ala Val Tyr Glu Ala Thr Met Pro Thr Leu
 40           165                 170                 175

      ccc cag aac ctg gag gtg aca aag agc acc ggg ttg ctt cca ggg aga    632
      Pro Gln Asn Leu Glu Val Thr Lys Ser Thr Gly Leu Leu Pro Gly Arg
               180                 185                 190
 45

      ggc cca ggt acc agt gca cca gga gaa ggg cag gag cga gct ccg ggg    680
      Gly Pro Gly Thr Ser Ala Pro Gly Glu Gly Gln Glu Arg Ala Pro Gly
      195                 200                 205                 210

 50   gcc cct gcc ttc ccc ttg gcc atc aag atg atg tgg aac atc tcg gca    728
      Ala Pro Ala Phe Pro Leu Ala Ile Lys Met Met Trp Asn Ile Ser Ala
                       215                 220                 225

      ggt tcc tcc agc gaa gcc atc ttg aac aca atg agc cag gag ctg gtc    776
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```
         Gly Ser Ser Ser Glu Ala Ile Leu Asn Thr Met Ser Gln Glu Leu Val
                     230             235                 240

 5       cca gcg agc cga gtg gcc ttg gct ggg gag tat gga gca gtc act tac    824
         Pro Ala Ser Arg Val Ala Leu Ala Gly Glu Tyr Gly Ala Val Thr Tyr
                     245             250                 255

         aga aaa tcc aag aga ggt ccc aag caa cta gcc cct cac ccc aac atc    872
         Arg Lys Ser Lys Arg Gly Pro Lys Gln Leu Ala Pro His Pro Asn Ile
 10          260             265                 270

         atc cgg gtt ctc cgc gcc ttc acc tct tcc gtg ccg ctg ctg cca ggg    920
         Ile Arg Val Leu Arg Ala Phe Thr Ser Ser Val Pro Leu Leu Pro Gly
         275             280                 285                 290
 15
         gcc ctg gtc gac tac cct gat gtg ctg ccc tca cgc ctc cac cct gaa    968
         Ala Leu Val Asp Tyr Pro Asp Val Leu Pro Ser Arg Leu His Pro Glu
                     295                 300                 305

 20      ggc ctg ggc cat ggc cgg acg ctg ttc ctc gtt atg aag aac tat ccc    1016
         Gly Leu Gly His Gly Arg Thr Leu Phe Leu Val Met Lys Asn Tyr Pro
                         310             315                 320

 25      tgt acc ctg cgc cag tac ctt tgt gtg aac aca ccc agc ccc cgc ctc    1064
         Cys Thr Leu Arg Gln Tyr Leu Cys Val Asn Thr Pro Ser Pro Arg Leu
                     325                 330                 335

         gcc gcc atg atg ctg ctg cag ctg ctg gaa ggc gtg gac cat ctg gtt    1112
         Ala Ala Met Met Leu Leu Gln Leu Leu Glu Gly Val Asp His Leu Val
 30          340                 345                 350

         caa cag ggc atc gcg cac aga gac ctg aaa tcc gac aac atc ctt gtg    1160
         Gln Gln Gly Ile Ala His Arg Asp Leu Lys Ser Asp Asn Ile Leu Val
         355                 360                 365                 370
 35
         gag ctg gac cca gac ggc tgc ccc tgg ctg gtg atc gca gat ttt ggc    1208
         Glu Leu Asp Pro Asp Gly Cys Pro Trp Leu Val Ile Ala Asp Phe Gly
                         375                 380                 385

 40      tgc tgc ctg gct gat gag agc atc ggc ctg cag ttg ccc ttc agc agc    1256
         Cys Cys Leu Ala Asp Glu Ser Ile Gly Leu Gln Leu Pro Phe Ser Ser
                         390                 395                 400

         tgg tac gtg gat cgg ggc gga aac ggc tgt ctg atg gcc cca gag gtg    1304
 45      Trp Tyr Val Asp Arg Gly Gly Asn Gly Cys Leu Met Ala Pro Glu Val
                     405                 410                 415

         tcc acg gcc cgt cct ggc ccc agg gca gtg att gac tac agc aag gct    1352
         Ser Thr Ala Arg Pro Gly Pro Arg Ala Val Ile Asp Tyr Ser Lys Ala
 50          420             425                 430

         gat gcc tgg gca gtg gga gcc atc gcc tat gaa atc ttc ggg ctt gtc    1400
         Asp Ala Trp Ala Val Gly Ala Ile Ala Tyr Glu Ile Phe Gly Leu Val
         435             440                 445                 450
```

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     aat ccc ttc tac ggc cag ggc aag gcc cac ctt gaa agc cgc agc tac   1448
     Asn Pro Phe Tyr Gly Gln Gly Lys Ala His Leu Glu Ser Arg Ser Tyr
                     455               460               465
 5
     caa gag gct cag cta cct gca ctg ccc gag tca gtg cct cca gac gtg   1496
     Gln Glu Ala Gln Leu Pro Ala Leu Pro Glu Ser Val Pro Pro Asp Val
                     470               475               480

10   aga cag ttg gtg agg gca ctg ctc cag cga gag gcc agc aag aga cca   1544
     Arg Gln Leu Val Arg Ala Leu Leu Gln Arg Glu Ala Ser Lys Arg Pro
                     485               490               495

     tct gcc cga gta gcc gca aat gtg ctt cat cta agc ctc tgg ggt gaa   1592
15   Ser Ala Arg Val Ala Ala Asn Val Leu His Leu Ser Leu Trp Gly Glu
                 500               505               510

     cat att cta gcc ctg aag aat ctg aag tta gac aag atg gtt ggc tgg   1640
     His Ile Leu Ala Leu Lys Asn Leu Lys Leu Asp Lys Met Val Gly Trp
20   515               520               525               530

     ctc ctc caa caa tcg gcc gcc act ttg ttg gcc aac agg ctc aca gag   1688
     Leu Leu Gln Gln Ser Ala Ala Thr Leu Leu Ala Asn Arg Leu Thr Glu
                     535               540               545
25
     aag tgt tgt gtg gaa aca aaa atg aag atg ctc ttt ctg gct aac ctg   1736
     Lys Cys Cys Val Glu Thr Lys Met Lys Met Leu Phe Leu Ala Asn Leu
                     550               555               560

30   gag tgt gaa acg ctc tgc cag gca gcc ctc ctc ctc tgc tca tgg agg   1784
     Glu Cys Glu Thr Leu Cys Gln Ala Ala Leu Leu Leu Cys Ser Trp Arg
                 565               570               575

     gca gcc ctg tgatgtccct gcatggagct ggtgaattac taaaagaact           1833
35   Ala Ala Leu
         580
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     tggcatcctc tgtgtcgtga tggtctgtga atggtgaggg tgggagtcag gagacaagac 1893

40   agcgcagaga gggctggtta gccggaaaag gcctcgggct ggcaaatgg aagaacttga 1953

     gtgagagttc agtctgcagt cctctgctca cagacatctg aaaagtgaat ggccaagctg 2013

     gtctagtaga tgaggctgga ctgaggaggg gtaggcctgc atccacagag aggatccagg 2073
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     ccaaggcact ggctgtcagt ggcagagttt ggctgtgacc tttgcccta acacgaggaa 2133

     ctcgtttgaa gggggcagcg tagcatgtct gatttgccac ctggatgaag gcagacatca 2193

50   acatgggtca gcacgttcag ttacgggagt gggaaattac atgaggcctg gcctctgcg 2253

     ttcccaagct gtgcgttctg gaccagctac tgaattatta atctcactta gcgaaagtga 2313

     cggatgagca gtaagtaagt aagtgtgggg atttaaactt gagggtttcc ctcctgacta 2373
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aaaaaaaaaa aagggcggcc c 2454

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Arg Pro Gly Pro Ala Ala Gly Cys Val Arg Gly Glu Arg Pro Gly Trp
20   35   40   45

Ala Ala Gly Pro Gly Ala Glu Pro Arg Arg Val Gly Leu Gly Leu Pro
        50   55   60

25 Asn Arg Leu Arg Phe Phe Arg Gln Ser Val Ala Gly Leu Ala Ala Arg
        65   70   75   80

Leu Gln Arg Gln Phe Val Val Arg Ala Trp Gly Cys Ala Gly Pro Cys
                85   90   95
30

Gly Arg Ala Val Phe Leu Ala Phe Gly Leu Gly Leu Gly Leu Ile Glu
                100   105   110

Glu Lys Gln Ala Glu Ser Arg Arg Ala Val Ser Ala Cys Gln Glu Ile
35   115   120   125

Gln Ala Ile Phe Thr Gln Lys Ser Lys Pro Gly Pro Asp Pro Leu Asp
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Thr Arg Arg Leu Gln Gly Phe Arg Leu Glu Glu Tyr Leu Ile Gly Gln
40 , 145   150   155   160

Ser Ile Gly Lys Gly Cys Ser Ala Ala Val Tyr Glu Ala Thr Met Pro
                165   170   175
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Thr Leu Pro Gln Asn Leu Glu Val Thr Lys Ser Thr Gly Leu Leu Pro
                180   185   190

Gly Arg Gly Pro Gly Thr Ser Ala Pro Gly Glu Gly Gln Glu Arg Ala
50   195   200   205

Pro Gly Ala Pro Ala Phe Pro Leu Ala Ile Lys Met Met Trp Asn Ile
        210   215   220

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     Ser Ala Gly Ser Ser Ser Glu Ala Ile Leu Asn Thr Met Ser Gln Glu
     225          ,       230              235              240

 5   Leu Val Pro Ala Ser Arg Val Ala Leu Ala Gly Glu Tyr Gly Ala Val
                      245              250              255

     Thr Tyr Arg Lys Ser Lys Arg Gly Pro Lys Gln Leu Ala Pro His Pro
                  260              265              270

10   Asn Ile Ile Arg Val Leu Arg Ala Phe Thr Ser Ser Val Pro Leu Leu
                  275              280              285

     Pro Gly Ala Leu Val Asp Tyr Pro Asp Val Leu Pro Ser Arg Leu His
         290              295              300
15
     Pro Glu Gly Leu Gly His Gly Arg Thr Leu Phe Leu Val Met Lys Asn
     305              310              315              320

     Tyr Pro Cys Thr Leu Arg Gln Tyr Leu Cys Val Asn Thr Pro Ser Pro
20                   325              330              335

     Arg Leu Ala Ala Met Met Leu Leu Gln Leu Leu Glu Gly Val Asp His
                  340              345              350

25   Leu Val Gln Gln Gly Ile Ala His Arg Asp Leu Lys Ser Asp Asn Ile
         355              360              365

     Leu Val Glu Leu Asp Pro Asp Gly Cys Pro Trp Leu Val Ile Ala Asp
         370              375              380
30
     Phe Gly Cys Cys Leu Ala Asp Glu Ser Ile Gly Leu Gln Leu Pro Phe
     385              390              395              400

     Ser Ser Trp Tyr Val Asp Arg Gly Gly Asn Gly Cys Leu Met Ala Pro
35                   405              410              415

     Glu Val Ser Thr Ala Arg Pro Gly Pro Arg Ala Val Ile Asp Tyr Ser
                  420              425              430

40   Lys Ala Asp Ala Trp Ala Val Gly Ala Ile Ala Tyr Glu Ile Phe Gly
                  435              440              445

     Leu Val Asn Pro Phe Tyr Gly Gln Gly Lys Ala His Leu Glu Ser Arg
         450              455              460
45
     Ser Tyr Gln Glu Ala Gln Leu Pro Ala Leu Pro Glu Ser Val Pro Pro
     465              470              475              480

     Asp Val Arg Gln Leu Val Arg Ala Leu Leu Gln Arg Glu Ala Ser Lys
50                   485              490              495

     Arg Pro Ser Ala Arg Val Ala Ala Asn Val Leu His Leu Ser Leu Trp
                  500              505              510
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        Gly Glu His Ile Leu Ala Leu Lys Asn Leu Lys Leu Asp Lys Met Val
            515                 520                 525

        Gly Trp Leu Leu Gln Gln Ser Ala Ala Thr Leu Leu Ala Asn Arg Leu
5           530                 535                 540

        Thr Glu Lys Cys Cys Val Glu Thr Lys Met Lys Met Leu Phe Leu Ala
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         1               5                  10                  15
30
        ctg ctg ctg cgc ttc acg ggc aag ccc ggc cgg gcc tac ggc ttg ggg    96
        Leu Leu Leu Arg Phe Thr Gly Lys Pro Gly Arg Ala Tyr Gly Leu Gly
                        20                  25                  30

35      cgg ccg ggc ccg gcg gcg ggc tgt gtc cgc ggg gag cgt cca ggc tgg   144
        Arg Pro Gly Pro Ala Ala Gly Cys Val Arg Gly Glu Arg Pro Gly Trp
                    35                  40                  45

        gcc gca gga ccg ggc gcg gag cct cgc agg gtc ggg ctc ggg ctt cct   192
40      Ala Ala Gly Pro Gly Ala Glu Pro Arg Arg Val Gly Leu Gly Leu Pro
                    50                  55                  60

        aac cgt ctc cgc ttc ttc cgc cag tcg gtg gcc ggg ctg gcg gcg cgg   240
        Asn Arg Leu Arg Phe Phe Arg Gln Ser Val Ala Gly Leu Ala Ala Arg
45      65                  70                  75                  80

        ttg cag cgg cag ttc gtg gtg cgg gcc tgg ggc tgc gcg ggc cct tgc   288
        Leu Gln Arg Gln Phe Val Val Arg Ala Trp Gly Cys Ala Gly Pro Cys
                        85                  90                  95
50
        ggc cgg gca gtc ttt ctg gcc ttc ggg cta ggg ctg ggc ctc atc gag   336
        Gly Arg Ala Val Phe Leu Ala Phe Gly Leu Gly Leu Gly Leu Ile Glu
                        100                 105                 110
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     gaa aaa cag gcg gag agc cgg cgg gcg gtc tcg gcc tgt cag gag atc   384
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             115                 120             125

 5   cag gca att ttt acc cag aaa agc aag ccg ggg cct gac ccg ttg gac   432
     Gln Ala Ile Phe Thr Gln Lys Ser Lys Pro Gly Pro Asp Pro Leu Asp
             130                 135             140

     acg aga cgc ttg cag ggc ttt cgg ctg gag gag tat ctg ata ggg cag   480
10   Thr Arg Arg Leu Gln Gly Phe Arg Leu Glu Glu Tyr Leu Ile Gly Gln
     145             150                 155                 160

     tcc att ggt aag ggc tgc agt gct gct gtg tat gaa gcc acc atg cct   528
     Ser Ile Gly Lys Gly Cys Ser Ala Ala Val Tyr Glu Ala Thr Met Pro
15                   165                 170                 175

     aca ttg ccc cag aac ctg gag gtg aca aag agc acc ggg ttg ctt cca   576
     Thr Leu Pro Gln Asn Leu Glu Val Thr Lys Ser Thr Gly Leu Leu Pro
                     180                 185             190
20
     ggg aga ggc cca ggt acc agt gca cca gga gaa ggg cag gag cga gct   624
     Gly Arg Gly Pro Gly Thr Ser Ala Pro Gly Glu Gly Gln Glu Arg Ala
                 195                 200             205

25   ccg ggg gcc cct gcc ttc ccc ttg gcc atc aag atg atg tgg aac atc   672
     Pro Gly Ala Pro Ala Phe Pro Leu Ala Ile Lys Met Met Trp Asn Ile
             210                 215             220

     tcg gca ggt tcc tcc agc gaa gcc atc ttg aac aca atg agc cag gag   720
30   Ser Ala Gly Ser Ser Ser Glu Ala Ile Leu Asn Thr Met Ser Gln Glu
     225             230                 235                 240

     ctg gtc cca gcg agc cga gtg gcc ttg gct ggg gag tat gga gca gtc   768
     Leu Val Pro Ala Ser Arg Val Ala Leu Ala Gly Glu Tyr Gly Ala Val
35                   245                 250                 255

     act tac aga aaa tcc aag aga ggt ccc aag caa cta gcc cct cac ccc   816
     Thr Tyr Arg Lys Ser Lys Arg Gly Pro Lys Gln Leu Ala Pro His Pro
                     260                 265             270
40
   . aac atc atc cgg gtt ctc cgc gcc ttc acc tct tcc gtg ccg ctg ctg   864
     Asn Ile Ile Arg Val Leu Arg Ala Phe Thr Ser Ser Val Pro Leu Leu
             275                 280             285

45   cca ggg gcc ctg gtc gac tac cct gat gtg ctg ccc tca cgc ctc cac   912
     Pro Gly Ala Leu Val Asp Tyr Pro Asp Val Leu Pro Ser Arg Leu His
             290                 295             300

     cct gaa ggc ctg ggc cat ggc cgg acg ctg ttc ctc gtt atg aag aac   960
50   Pro Glu Gly Leu Gly His Gly Arg Thr Leu Phe Leu Val Met Lys Asn
     305             310                 315                 320

     tat ccc tgt acc ctg cgc cag tac ctt tgt gtg aac aca ccc agc ccc   1008
     Tyr Pro Cys Thr Leu Arg Gln Tyr Leu Cys Val Asn Thr Pro Ser Pro
```

```
                    325                      330                      335

     cgc ctc gcc gcc atg atg ctg ctg cag ctg ctg gaa ggc gtg gac cat    1056
     Arg Leu Ala Ala Met Met Leu Leu Gln Leu Leu Glu Gly Val Asp His
  5          340                  345                  350

     ctg gtt caa cag ggc atc gcg cac aga gac ctg aaa tcc gac aac atc    1104
     Leu Val Gln Gln Gly Ile Ala His Arg Asp Leu Lys Ser Asp Asn Ile
             355                  360                  365
 10
     ctt gtg gag ctg gac cca gac ggc tgc ccc tgg ctg gtg atc gca gat    1152
     Leu Val Glu Leu Asp Pro Asp Gly Cys Pro Trp Leu Val Ile Ala Asp
             370                  375                  380

 15  ttt ggc tgc tgc ctg gct gat gag agc atc ggc ctg cag ttg ccc ttc    1200
     Phe Gly Cys Cys Leu Ala Asp Glu Ser Ile Gly Leu Gln Leu Pro Phe
     385                  390                  395                  400

     agc agc tgg tac gtg gat cgg ggc gga aac ggc tgt ctg atg gcc cca    1248
 20  Ser Ser Trp Tyr Val Asp Arg Gly Gly Asn Gly Cys Leu Met Ala Pro
                      405                  410                  415

     gag gtg tcc acg gcc cgt cct ggc ccc agg gca gtg att gac tac agc    1296
     Glu Val Ser Thr Ala Arg Pro Gly Pro Arg Ala Val Ile Asp Tyr Ser
 25          420                  425                  430

     aag gct gat gcc tgg gca gtg gga gcc atc gcc tat gaa atc ttc ggg    1344
     Lys Ala Asp Ala Trp Ala Val Gly Ala Ile Ala Tyr Glu Ile Phe Gly
             435                  440                  445
 30
     ctt gtc aat ccc ttc tac ggc cag ggc aag gcc cac ctt gaa agc cgc    1392
     Leu Val Asn Pro Phe Tyr Gly Gln Gly Lys Ala His Leu Glu Ser Arg
             450                  455                  460

 35  agc tac caa gag gct cag cta cct gca ctg ccc gag tca gtg cct cca    1440
     Ser Tyr Gln Glu Ala Gln Leu Pro Ala Leu Pro Glu Ser Val Pro Pro
     465                  470                  475                  480

     gac gtg aga cag ttg gtg agg gca ctg ctc cag cga gag gcc agc aag    1488
 40  Asp Val Arg Gln Leu Val Arg Ala Leu Leu Gln Arg Glu Ala Ser Lys
                      485                  490                  495

     aga cca tct gcc cga gta gcc gca aat gtg ctt cat cta agc ctc tgg    1536
     Arg Pro Ser Ala Arg Val Ala Ala Asn Val Leu His Leu Ser Leu Trp
             500                  505                  510
 45
     ggt gaa cat att cta gcc ctg aag aat ctg aag tta gac aag atg gtt    1584
     Gly Glu His Ile Leu Ala Leu Lys Asn Leu Lys Leu Asp Lys Met Val
             515                  520                  525
 50
     ggc tgg ctc ctc caa caa tcg gcc gcc act ttg ttg gcc aac agg ctc    1632
     Gly Trp Leu Leu Gln Gln Ser Ala Ala Thr Leu Leu Ala Asn Arg Leu
             530                  535                  540
```

```
      aca gag aag tgt tgt gtg gaa aca aaa atg aag atg ctc ttt ctg gct   1680
      Thr Glu Lys Cys Cys Val Glu Thr Lys Met Lys Met Leu Phe Leu Ala
      545                 550                 555                 560

5     aac ctg gag tgt gaa acg ctc tgc cag gca gcc ctc ctc ctc tgc tca   1728
      Asn Leu Glu Cys Glu Thr Leu Cys Gln Ala Ala Leu Leu Leu Cys Ser
                          565                 570                 575

      tgg agg gca gcc ctg                                               1743
10    Trp Arg Ala Ala Leu
                      580



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      cgcttttgag tccgttgaag acacaatttc tctctgtcgg gtgcttagga ggagctccat 120

      gaacatgtat tgaattggac ttagctgaac aggctgctgg ttggctgccc agaggggca 180

30    ggctgtgttg ctgggagcct tccagctccc tgcagcagtc atggggcagg gttccccgag 240

      tccgtaatcc ccatttccac ctactttccc ttag tta ttt gat tcc ctg tct gtc 295
                                           Leu Phe Asp Ser Leu Ser Val
                                            1               5
35
      gta ctc agc tta agt gga gca tcc cct ttc ctg gga gac acg aag cag   343
      Val Leu Ser Leu Ser Gly Ala Ser Pro Phe Leu Gly Asp Thr Lys Gln
              10                  15                  20

40    gaa aca ctg gca aat atc aca gca gtg agt tac gac ttt gat gag gaa   391
      Glu Thr Leu Ala Asn Ile Thr Ala Val Ser Tyr Asp Phe Asp Glu Glu
              25                  30                  35

      ttc ttc agc cag acg agc gag ctg gcc aag gac ttt att cgg aag ctt   439
45    Phe Phe Ser Gln Thr Ser Glu Leu Ala Lys Asp Phe Ile Arg Lys Leu
          40                  45                  50                  55

      ctg gtt aaa gag acc cgg aaa cgg ctc aca atc caa gag gct ctc aga   487
      Leu Val Lys Glu Thr Arg Lys Arg Leu Thr Ile Gln Glu Ala Leu Arg
50                        60                  65                  70

      cac ccc tgg atc acg ccg gtg gac aac cag caa gcc atg gtg cgc agg   535
      His Pro Trp Ile Thr Pro Val Asp Asn Gln Gln Ala Met Val Arg Arg
                      75                  80                  85
```

```
     gag tct gtg gtc aat ctg gag aac ttc agg aag cag tat gtc cgc agg   583
     Glu Ser Val Val Asn Leu Glu Asn Phe Arg Lys Gln Tyr Val Arg Arg
              90              95              100

 5
     cgg tgg aag ctt tcc ttc agc atc gtg tcc ctg tgc aac cac ctc acc   631
     Arg Trp Lys Leu Ser Phe Ser Ile Val Ser Leu Cys Asn His Leu Thr
              105             110             115

10   cgc tcg ctg atg aag aag gtg cac ctg agg ccg gat gag gac ctg agg   679
     Arg Ser Leu Met Lys Lys Val His Leu Arg Pro Asp Glu Asp Leu Arg
     120             125             130             135

     aac tgt gag agt gac act gag gag gac atc gcc agg agg aaa gcc ctc   727
15   Asn Cys Glu Ser Asp Thr Glu Glu Asp Ile Ala Arg Arg Lys Ala Leu
                  140             145             150

     cac cca cgg agg agg agc agc acc tcc taactggcct gacctgcagt         774
     His Pro Arg Arg Arg Ser Ser Thr Ser
20               155             160

     ggccgccagg gaggtctggg cccagcgggg ctcccttctg tgcagacttt tggacccagc 834

25   tcagcaccag cacccgggcg tcctgagcac tttgcaagag agatgggccc aaggaattca 894

     gaagagcttg caggcaagcc aggagaccct gggagctgtg gctgtcttct gtggaggagg 954

     ctccagcatt cccaaagctc ttaattctcc ataaaatggg ctttcctctg tctgccatcc 1014

30   tcagagtctg gggtgggagt gtggacttag gaaaacaata taaggacat cctcatcatc 1074

     acggggtgaa ggtcagacta aggcagcctt cttcacaggc tgagggggtt cagaaccagc 1134

     ctggccaaaa attacaccag agagacagag tcctccccat gggaacagg gtgattgagg 1194

35   aaagtgaacc ttgggtgtga gggaccaatc ctgtgacctc ccagaaccat ggaagccagg 1254

     acgtcaggct gaccaacacc tcagaccttc tgaagcagcc cattgctggc ccgccatgtt 1314

     gtaattttgc tcatttttat taaacttctg gtttacctga tgcttggctt cttttagggc 1374

40   tacccccatc tcatttcctt tagcccgtgt gcctgtaact ctgagggggg gcacccagtg 1434

     gggtgctgag tgggcagaat ctcagaaggt cctcctgaac cgtccgcgca ggcctgcagt 1494

45   gggcctgcct cctccttgct tccctaacag gaaggtgtcc agttcaagag aacccaccca 1554

     gagactggga gtggtggctc acgcctataa tccctgcgct ttggcagtcc gaggcagggg 1614

50   aattgcttga actcaggagt tggagaccag cctgggcaac atggcaaaac gcagtctgta 1674

     caaaaaatac aaaaaattag ccaggtgtag gggtaggcac ctggcatccc agctactcca 1734

     ggggctgagg tgacagcatt gcttaagccc agaaggtcga ggctgcagtg agctgagatc 1794
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acgccactgc.actccagtct gggtgacaga gagagaccat atccaaaaaa aaaaaaaaaa 1854

gggcggccgc   1864

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10 <213> Homo sapiens

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Leu Phe Asp Ser Leu Ser Val Val Leu Ser Leu Ser Gly Ala Ser Pro
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15

Phe Leu Gly Asp Thr Lys Gln Glu Thr Leu Ala Asn Ile Thr Ala Val
            20   25   30

Ser Tyr Asp Phe Asp Glu Glu Phe Phe Ser Gln Thr Ser Glu Leu Ala
20   35   40   45

Lys Asp Phe Ile Arg Lys Leu Leu Val Lys Glu Thr Arg Lys Arg Leu
        50   55   60

25 Thr Ile Gln Glu Ala Leu Arg His Pro Trp Ile Thr Pro Val Asp Asn
        65   70   75   80

Gln Gln Ala Met Val Arg Arg Glu Ser Val Val Asn Leu Glu Asn Phe
                85   90   95

30

Arg Lys Gln Tyr Val Arg Arg Arg Trp Lys Leu Ser Phe Ser Ile Val
                100   105   110

Ser Leu Cys Asn His Leu Thr Arg Ser Leu Met Lys Lys Val His Leu
35   115   120   125

Arg Pro Asp Glu Asp Leu Arg Asn Cys Glu Ser Asp Thr Glu Glu Asp
        130   135   140

40 Ile Ala Arg Arg Lys Ala Leu His Pro Arg Arg Arg Ser Ser Thr Ser
    145   150   155   160

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         Leu Phe Asp Ser Leu Ser Val Val Leu Ser Leu Ser Gly Ala Ser Pro
          1           ,       5                   10                  15

    5    ttc ctg gga gac acg aag cag gaa aca ctg gca aat atc aca gca gtg    96
         Phe Leu Gly Asp Thr Lys Gln Glu Thr Leu Ala Asn Ile Thr Ala Val
                          20                  25                  30

         agt tac gac ttt gat gag gaa ttc ttc agc cag acg agc gag ctg gcc   144
         Ser Tyr Asp Phe Asp Glu Glu Phe Phe Ser Gln Thr Ser Glu Leu Ala
   10                  35                  40                  45

         aag gac ttt att cgg aag ctt ctg gtt aaa gag acc cgg aaa cgg ctc   192
         Lys Asp Phe Ile Arg Lys Leu Leu Val Lys Glu Thr Arg Lys Arg Leu
                  50                  55                  60
   15
         aca atc caa gag gct ctc aga cac ccc tgg atc acg ccg gtg gac aac   240
         Thr Ile Gln Glu Ala Leu Arg His Pro Trp Ile Thr Pro Val Asp Asn
                  65                  70                  75                  80

   20    cag caa gcc atg gtg cgc agg gag tct gtg gtc aat ctg gag aac ttc   288
         Gln Gln Ala Met Val Arg Arg Glu Ser Val Val Asn Leu Glu Asn Phe
                          85                  90                  95

         agg aag cag tat gtc cgc agg cgg tgg aag ctt tcc ttc agc atc gtg   336
   25    Arg Lys Gln Tyr Val Arg Arg Arg Trp Lys Leu Ser Phe Ser Ile Val
                          100                 105                 110

         tcc ctg tgc aac cac ctc acc cgc tcg ctg atg aag aag gtg cac ctg   384
         Ser Leu Cys Asn His Leu Thr Arg Ser Leu Met Lys Lys Val His Leu
   30                  115                 120                 125

         agg ccg gat gag gac ctg agg aac tgt gag agt gac act gag gag gac   432
         Arg Pro Asp Glu Asp Leu Arg Asn Cys Glu Ser Asp Thr Glu Glu Asp
                  130                 135                 140
   35
         atc gcc agg agg aaa gcc ctc cac cca cgg agg agg agc agc acc tcc   480
         Ile Ala Arg Arg Lys Ala Leu His Pro Arg Arg Arg Ser Ser Thr Ser
         145                 150                 155                 160

   40
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           Thr Ala Leu Ala Lys Glu Leu Arg Glu Leu Arg Ile Glu Glu Thr Asn
            1           5                   10                  15
```

```
        cgc cca atg aag aag gtg act gat tac tcc tcc tcc agt gag gag tca   97
        Arg Pro Met Lys Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu Glu Ser
                     20              25                  30

 5      gaa agt agc gag gaa gag gag gaa gat gga gag agc gag acc cat gat  145
        Glu Ser Ser Glu Glu Glu Glu Glu Asp Gly Glu Ser Glu Thr His Asp
                     35                  40                  45

        ggg aca gtg gct gtc agc gac ata ccc aga ctg ata cca aca gga gct  193
10      Gly Thr Val Ala Val Ser Asp Ile Pro Arg Leu Ile Pro Thr Gly Ala
                     50                  55                  60

        cca ggc agc aac gag cag tac aat gtg gga atg gtg ggg acg cat ggg  241
        Pro Gly Ser Asn Glu Gln Tyr Asn Val Gly Met Val Gly Thr His Gly
15      65                  70                  75                  80

        ctg gag acc tct cat gcg gac agt ttc agc ggc agt att tca aga gaa  289
        Leu Glu Thr Ser His Ala Asp Ser Phe Ser Gly Ser Ile Ser Arg Glu
                             85                  90                  95
20
        gga acc ttg atg att aga gag acg tct gga gag aag aag cga tct ggc  337
        Gly Thr Leu Met Ile Arg Glu Thr Ser Gly Glu Lys Lys Arg Ser Gly
                     100                 105                 110

25      cac agt gac agc aat ggc ttt gct ggc cac atc aac ctc cct gac ctg  385
        His Ser Asp Ser Asn Gly Phe Ala Gly His Ile Asn Leu Pro Asp Leu
                     115                 120                 125

        gtg cag cag agc cat tct cca gct gga acc ccg act gag gga ctg ggg  433
30      Val Gln Gln Ser His Ser Pro Ala Gly Thr Pro Thr Glu Gly Leu Gly
                     130                 135                 140

        cgc gtc tca acc cat tcc cag gag atg gac tct ggg act gaa tat ggc  481
        Arg Val Ser Thr His Ser Gln Glu Met Asp Ser Gly Thr Glu Tyr Gly
35      145                 150                 155                ·160

        atg ggg agc agc acc aaa gcc tcc ttc acc ccc ttt gtg gac ccc aga  529
        Met Gly Ser Ser Thr Lys Ala Ser Phe Thr Pro Phe Val Asp Pro Arg
                     165                 170                 175
40
       .gta tac cag acg tct ccc act gat gaa gat gaa gag gat gag gaa tca  577
        Val Tyr Gln Thr Ser Pro Thr Asp Glu Asp Glu Glu Asp Glu Glu Ser
                     180                 185                 190

45      tca gcc gca gct ctg ttt act agc gaa ctt ctt agg caa gaa cag gcc  625
        Ser Ala Ala Ala Leu Phe Thr Ser Glu Leu Leu Arg Gln Glu Gln Ala
                     195                 200                 205

        aaa ctc aat gaa gca aga aag att tcg gtg gta aat gta aac cca acc  673
50      Lys Leu Asn Glu Ala Arg Lys Ile Ser Val Val Asn Val Asn Pro Thr
                     210                 215                 220

        aac att cgg cct cat agc gac aca cca gaa atc aga aaa tac aag aaa  721
        Asn Ile Arg Pro His Ser Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys
```

	225					230					235					240			

```
        cga ttc aac tca gaa ata ctt tgt gca gct ctg tgg ggt gta aac ctt    769
        Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly Val Asn Leu
  5                 245             250             255

        ctg gtg ggg act gaa aat ggc ctg atg ctt ttg gac cga agt ggg caa    817
        Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg Ser Gly Gln
                        260             265             270
 10
        ggc aaa gtc tat aat ctg atc aac cgg agg cga ttt cag cag atg gat    865
        Gly Lys Val Tyr Asn Leu Ile Asn Arg Arg Arg Phe Gln Gln Met Asp
                    275             280             285

 15     gtg cta gag gga ctg aat gtc ctt gtg aca att tca gga aag aag aat    913
        Val Leu Glu Gly Leu Asn Val Leu Val Thr Ile Ser Gly Lys Lys Asn
                290             295             300

        aag cta cga gtt tac tat ctt tca tgg tta aga aac aga ata cta cat    961
 20     Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu Arg Asn Arg Ile Leu His
        305             310             315             320

        aat gac cca gaa gta gaa aag aaa caa ggc tgg atc act gtt ggg gac    1009
        Asn Asp Pro Glu Val Glu Lys Lys Gln Gly Trp Ile Thr Val Gly Asp
 25                 325             330             335

        ttg gaa ggc tgt ata cat tat aaa gtt gtt aaa tat gaa agg atc aaa    1057
        Leu Glu Gly Cys Ile His Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys
                    340             345             350
 30
        ttt ttg gtg att gcc tta aag aat gct gtg gaa ata tat gct tgg gct    1105
        Phe Leu Val Ile Ala Leu Lys Asn Ala Val Glu Ile Tyr Ala Trp Ala
                    355             360             365

 35     cct aaa ccg tat cat aaa ttc atg gca ttt aag tct ttt gca gat ctc    1153
        Pro Lys Pro Tyr His Lys Phe Met Ala Phe Lys Ser Phe Ala Asp Leu
                370             375             380

        cag cac aag cct ctg cta gtt gat ctc acg gta gaa gaa ggt caa aga    1201
 40     Gln His Lys Pro Leu Leu Val Asp Leu Thr Val Glu Glu Gly Gln Arg
        385             390             395             400

        tta aag gtt att ttt ggt tca cac act ggt ttc cat gta att gat gtt    1249
        Leu Lys Val Ile Phe Gly Ser His Thr Gly Phe His Val Ile Asp Val
 45                 405             410             415

        gat tca gga aac tct tat gat atc tac ata cca tct cat att cag ggc    1297
        Asp Ser Gly Asn Ser Tyr Asp Ile Tyr Ile Pro Ser His Ile Gln Gly
                    420             425             430
 50
        aat atc act cct cat gct att gtc atc ttg cct aaa                    1333
        Asn Ile Thr Pro His Ala Ile Val Ile Leu Pro Lys
                435             440
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 1               5                  10                  15

Arg Pro Met Lys Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu Glu Ser
            20                  25                  30

Glu Ser Ser Glu Glu Glu Glu Glu Asp Gly Glu Ser Glu Thr His Asp
        35                  40                  45

Gly Thr Val Ala Val Ser Asp Ile Pro Arg Leu Ile Pro Thr Gly Ala
        50                  55                  60

Pro Gly Ser Asn Glu Gln Tyr Asn Val Gly Met Val Gly Thr His Gly
 65                  70                  75                  80

Leu Glu Thr Ser His Ala Asp Ser Phe Ser Gly Ser Ile Ser Arg Glu
                85                  90                  95

Gly Thr Leu Met Ile Arg Glu Thr Ser Gly Glu Lys Lys Arg Ser Gly
            100                 105                 110

His Ser Asp Ser Asn Gly Phe Ala Gly His Ile Asn Leu Pro Asp Leu
            115                 120                 125

Val Gln Gln Ser His Ser Pro Ala Gly Thr Pro Thr Glu Gly Leu Gly
        130                 135                 140

Arg Val Ser Thr His Ser Gln Glu Met Asp Ser Gly Thr Glu Tyr Gly
145                 150                 155                 160

Met Gly Ser Ser Thr Lys Ala Ser Phe Thr Pro Phe Val Asp Pro Arg
                165                 170                 175

Val Tyr Gln Thr Ser Pro Thr Asp Glu Asp Glu Glu Asp Glu Glu Ser
            180                 185                 190

Ser Ala Ala Ala Leu Phe Thr Ser Glu Leu Leu Arg Gln Glu Gln Ala
        195                 200                 205

Lys Leu Asn Glu Ala Arg Lys Ile Ser Val Val Asn Val Asn Pro Thr
    210                 215                 220

Asn Ile Arg Pro His Ser Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys
225                 230                 235                 240

Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly Val Asn Leu
            245                 250                 255
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       Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg Ser Gly Gln
                260                 265                 270

  5    Gly Lys Val Tyr Asn Leu Ile Asn Arg Arg Arg Phe Gln Gln Met Asp
                275                 280                 285

       Val Leu Glu Gly Leu Asn Val Leu Val Thr Ile Ser Gly Lys Lys Asn
                290                 295                 300
 10
       Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu Arg Asn Arg Ile Leu His
       305                 310                 315                 320

       Asn Asp Pro Glu Val Glu Lys Lys Gln Gly Trp Ile Thr Val Gly Asp
 15             325                 330                 335

       Leu Glu Gly Cys Ile His Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys
                340                 345                 350

 20    Phe Leu Val Ile Ala Leu Lys Asn Ala Val Glu Ile Tyr Ala Trp Ala
                355                 360                 365

       Pro Lys Pro Tyr His Lys Phe Met Ala Phe Lys Ser Phe Ala Asp Leu
                370                 375                 380
 25
       Gln His Lys Pro Leu Leu Val Asp Leu Thr Val Glu Glu Gly Gln Arg
       385                 390                 395                 400

       Leu Lys Val Ile Phe Gly Ser His Thr Gly Phe His Val Ile Asp Val
 30                 405                 410                 415

       Asp Ser Gly Asn Ser Tyr Asp Ile Tyr Ile Pro Ser His Ile Gln Gly
                420                 425                 430

 35    Asn Ile Thr Pro His Ala Ile Val Ile Leu Pro Lys
                435                 440


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 50    Thr Ala Leu Ala Lys Glu Leu Arg Glu Leu Arg Ile Glu Glu Thr Asn
         1               5                  10                  15

       cgc cca atg aag aag gtg act gat tac tcc tcc tcc agt gag gag tca   96
       Arg Pro Met Lys Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu Glu Ser
```

```
                       20                    25                    30

        gaa agt agc gag gaa gag gag gaa gat gga gag agc gag acc cat gat    144
        Glu Ser Ser Glu Glu Glu Glu Glu Asp Gly Glu Ser Glu Thr His Asp
  5             35                    40                    45

        ggg aca gtg gct gtc agc gac ata ccc aga ctg ata cca aca gga gct    192
        Gly Thr Val Ala Val Ser Asp Ile Pro Arg Leu Ile Pro Thr Gly Ala
                50                    55                    60
  10
        cca ggc agc aac gag cag tac aat gtg gga atg gtg ggg acg cat ggg    240
        Pro Gly Ser Asn Glu Gln Tyr Asn Val Gly Met Val Gly Thr His Gly
          65                    70                    75                80

  15    ctg gag acc tct cat gcg gac agt ttc agc ggc agt att tca aga gaa    288
        Leu Glu Thr Ser His Ala Asp Ser Phe Ser Gly Ser Ile Ser Arg Glu
                          85                    90                    95

        gga acc ttg atg att aga gag acg tct gga gag aag aag cga tct ggc    336
  20    Gly Thr Leu Met Ile Arg Glu Thr Ser Gly Glu Lys Lys Arg Ser Gly
                          100                   105                   110

        cac agt gac agc aat ggc ttt gct ggc cac atc aac ctc cct gac ctg    384
        His Ser Asp Ser Asn Gly Phe Ala Gly His Ile Asn Leu Pro Asp Leu
  25             115                   120                   125

        gtg cag cag agc cat tct cca gct gga acc ccg act gag gga ctg ggg    432
        Val Gln Gln Ser His Ser Pro Ala Gly Thr Pro Thr Glu Gly Leu Gly
                130                   135                   140
  30
        cgc gtc tca acc cat tcc cag gag atg gac tct ggg act gaa tat ggc    480
        Arg Val Ser Thr His Ser Gln Glu Met Asp Ser Gly Thr Glu Tyr Gly
        145                   150                   155                   160

  35    atg ggg agc agc acc aaa gcc tcc ttc acc ccc ttt gtg gac ccc aga    528
        Met Gly Ser Ser Thr Lys Ala Ser Phe Thr Pro Phe Val Asp Pro Arg
                          165                   170                   175

        gta tac cag acg tct ccc act gat gaa gat gaa gag gat gag gaa tca    576
  40    Val Tyr Gln Thr Ser Pro Thr Asp Glu Asp Glu Glu Asp Glu Glu Ser
                          180                   185                   190

        tca gcc gca gct ctg ttt act agc gaa ctt ctt agg caa gaa cag gcc    624
        Ser Ala Ala Ala Leu Phe Thr Ser Glu Leu Leu Arg Gln Glu Gln Ala
  45             195                   200                   205

        aaa ctc aat gaa gca aga aag att tcg gtg gta aat gta aac cca acc    672
        Lys Leu Asn Glu Ala Arg Lys Ile Ser Val Val Asn Val Asn Pro Thr
                210                   215                   220
  50
        aac att cgg cct cat agc gac aca cca gaa atc aga aaa tac aag aaa    720
        Asn Ile Arg Pro His Ser Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys
        225                   230                   235                   240
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       cga ttc aac tca gaa ata ctt tgt gca gct ctg tgg ggt gta aac ctt    768
       Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly Val Asn Leu
                   245             250                 255

  5    ctg gtg ggg act gaa aat ggc ctg atg ctt ttg gac cga agt ggg caa    816
       Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg Ser Gly Gln
                   260             265                 270

       ggc aaa gtc tat aat ctg atc aac cgg agg cga ttt cag cag atg gat    864
 10    Gly Lys Val Tyr Asn Leu Ile Asn Arg Arg Arg Phe Gln Gln Met Asp
                   275             280                 285

       gtg cta gag gga ctg aat gtc ctt gtg aca att tca gga aag aag aat    912
       Val Leu Glu Gly Leu Asn Val Leu Val Thr Ile Ser Gly Lys Lys Asn
                   290             295                 300
 15

       aag cta cga gtt tac tat ctt tca tgg tta aga aac aga ata cta cat    960
       Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu Arg Asn Arg Ile Leu His
       305             310             315                 320
 20

       aat gac cca gaa gta gaa aag aaa caa ggc tgg atc act gtt ggg gac   1008
       Asn Asp Pro Glu Val Glu Lys Lys Gln Gly Trp Ile Thr Val Gly Asp
                   325             330                 335

 25    ttg gaa ggc tgt ata cat tat aaa gtt gtt aaa tat gaa agg atc aaa   1056
       Leu Glu Gly Cys Ile His Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys
                   340             345                 350

       ttt ttg gtg att gcc tta aag aat gct gtg gaa ata tat gct tgg gct   1104
 30    Phe Leu Val Ile Ala Leu Lys Asn Ala Val Glu Ile Tyr Ala Trp Ala
                   355             360                 365

       cct aaa ccg tat cat aaa ttc atg gca ttt aag tct ttt gca gat ctc   1152
       Pro Lys Pro Tyr His Lys Phe Met Ala Phe Lys Ser Phe Ala Asp Leu
 35    370             375                 380

       cag cac aag cct ctg cta gtt gat ctc acg gta gaa gaa ggt caa aga   1200
       Gln His Lys Pro Leu Leu Val Asp Leu Thr Val Glu Glu Gly Gln Arg
       385             390             395                 400
 40
       tta aag gtt att ttt ggt tca cac act ggt ttc cat gta att gat gtt   1248
       Leu Lys Val Ile Phe Gly Ser His Thr Gly Phe His Val Ile Asp Val
                   405             410                 415

 45    gat tca gga aac tct tat gat atc tac ata cca tct cat att cag ggc   1296
       Asp Ser Gly Asn Ser Tyr Asp Ile Tyr Ile Pro Ser His Ile Gln Gly
                   420             425                 430

       aat atc act cct cat gct att gtc atc ttg cct aaa                   1332
 50    Asn Ile Thr Pro His Ala Ile Val Ile Leu Pro Lys
                   435             440
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